Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Form PCT/IPEA/416
25516 WO		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP2004/002170	03.03.2004	05.03.2003
International Patent Classification (IPC) or national classification and IPC		
Applicant		
FRAUNHOFER-GESELLSCHAFT ZUR FÖRDERUNG DER ANGEWANDTEN FORSCHUNG E.V.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 8 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *(sent to the applicant and to the International Bureau)* a total of _____ sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))
      _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:
   - ☒ Box No. I Basis of the report
   - ☐ Box No. II Priority
   - ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☐ Box No. IV Lack of unity of invention
   - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☐ Box No. VII Certain defects in the international application
   - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/002170

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

☐ international search (Rule 12.3 and 23.1(b))

☐ publication of the international application (Rule 12.4)

☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-48 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

nos. 1-137 as originally filed/furnished

nos.* _____ as amended (together with any statement) under Article 19

nos.* _____ received by this Authority on _____

nos.* _____ received by this Authority on _____

☒ the drawings:

sheets 1/3-3/3 as originally filed/furnished

sheets* _____ received by this Authority on _____

sheets* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/002170

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application

☒ claims Nos. 55-81,114,128-131,137

because:

☐ the said international application, or the said claims Nos. _____
relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. _____
are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. _____ are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claims Nos. 55-81,114,128-131,137

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form
- ☐ has not been furnished
- ☐ does not comply with the standard

the computer readable form
- ☐ has not been furnished
- ☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See Supplemental Box for further details.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/002170

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	2-54, 82-113, 116-121, 124-127	YES
	Claims	1, 115, 122, 123, 132-136	NO
Inventive step (IS)	Claims		YES
	Claims	1-54, 82-113, 115-127, 132-136	NO
Industrial applicability (IA)	Claims	1-54, 82-113, 115-127, 132-136	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: PETER J F ET AL: "A general strategy for epitope mapping by direct MALDI-TOF mass spectrometry using secondary antibodies and cross-linking", ANALYTICAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY. COLUMBUS, US, Vol. 73, No. 16, 15 August 2001 (2001-08-15), pages 4012-4019, XP002263286, ISSN 0003-2700

D2: US-A-5 595 881 (KENDRICK ET AL), 21 January 1997 (1997-01-21)

D3: US 2002/034827 A1 (SINGH RAJENDRA ET AL), 21 March 2002 (2002-03-21)

D4: LEE HAESHIN ET AL: "A receptor-mediated gene delivery system using streptavidin and biotin-derivatized, pegylated epidermal growth factor", JOURNAL OF CONTROLLED RELEASE, Vol. 83, No. 1 , 18 September 2002 (2002-09-18), pages 109-119, XP002322132, ISSN 0168-3659

D5: THANH NGUYEN THI KIM ET AL: "Laser-based double beam absorption detection for aggregation immunoassays using gold nanoparticles", ANALYTICAL AND BIOANALYTICAL CHEMISTRY, Vol. 374, No. 7-8, December 2002 (2002-12), pages 1174-1178, XP002322133, ISSN 1618-2642

D6: FLAD THOMAS ET AL: "Development of an MHC-class I

peptide selection assay combining nanoparticle technology and matrix-assisted laser desorption/ionisation mass spectrometry", JOURNAL OF IMMUNOLOGICAL METHODS, Vol. 283, No. 1-2, December 2003 (2003-12), pages 205-213, XP002322134, ISSN 0022-1759

1. The application fails to meet the requirements of PCT Article 33(1) because the subject matter of claims 1, 115 and 133 is not novel (PCT Article 33(2)).

Document D1 discloses the use of particles containing an antibody and an antigen at the surface in a process for identifying T-cell epitopes. The particles are analysed by MALDI mass spectrometry (see the abstract, page 4012, right-hand column, last paragraph to page 4013, left-hand column, last paragraph, and page 4015). Claims 1, 115 and 133 therefore lack novelty (PCT Article 33(2)).

The application fails to meet the requirements of PCT Article 33(1) because the subject matter of claims 2 to 54 and 82 to 107 does not involve an inventive step (PCT Article 33(3)).

Document D1, which is considered to be the prior art closest to the subject matter of claim 82, discloses direct analysis of particles containing an antibody-ligand complex at the surface using a MALDI process. The only difference between the subject matter of claim 82 and the known process is the fact that the receptor in the particles comprises two receptor units. However, there does not appear to be any technical advantage

associated with this difference, and the technical problem addressed is therefore that of providing an alternative receptor for use in screening processes. This feature is just one of a number of obvious possibilities from which a person skilled in the art would choose according to the circumstances without making an inventive contribution in order to solve the problem of interest, and consequently an inventive step cannot be acknowledged for claim 82 (PCT Article 33(3)).

For the same reasons, independent claims 89 and 105 are not inventive either (PCT Article 33(3)).

Dependent claims 2 to 54, 83 to 88, 90 to 104 and 106 to 107 do not contain any features that meet the PCT requirements in respect of inventive step when combined with the features of any of the back-referenced claims.

2. Document D2 discloses the use of particles containing complexes of peptides and HLA-DR2 at the surface in a process for isolating specific T-cells (see the abstract and page 1, lines 34 to 59, and example 1). Claims 89, 108, 115, 122, 123, 132 and 134 to 136 therefore lack novelty (PCT Article 33(2)).

Dependent claims 90 to 104, 108 to 113, 116 to 121 and 124 to 127 do not contain any features that meet the PCT requirements in respect of inventive step when combined with the features of any of the back-referenced claims.

3. Document D3 discloses nanoparticles containing receptors at the surface (paragraphs [0048], [0049], [0073] and

[0078], and the tables). Claim 115 therefore lacks novelty (PCT Article 33(2)).

Document D4 discloses nanoparticles containing streptavidin and biotin-PEG-EGF (Epidermal Growth Factor) conjugates at the surface (see the abstract). Claim 115 therefore lacks novelty (PCT Article 33(2)).

Document D5 discloses gold nanoparticles containing protein antigens at the surface (see the abstract). Claim 115 therefore lacks novelty (PCT Article 33(2)).

4. Document D6, which is shown in the search report as a category "P" document, is not included in the prior art because the claimed priority date can be allowed for the relevant parts of the present application.

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Box III
Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

No expert opinion has been established regarding novelty, inventive step or industrial applicability in respect of the subject matter of claims 55 to 81, 114, 128 to 131 and 137 because the said subject matter was not searched (PCT Rule 66.1(e)).